

(No Model.)

C. DETRICK.

MACHINE FOR MAKING LINED CONDUITS OF PLASTIC OR SEMI  
PLASTIC MATERIAL.

No. 288,034.

Patented Nov. 6, 1883.

FIG. 2.

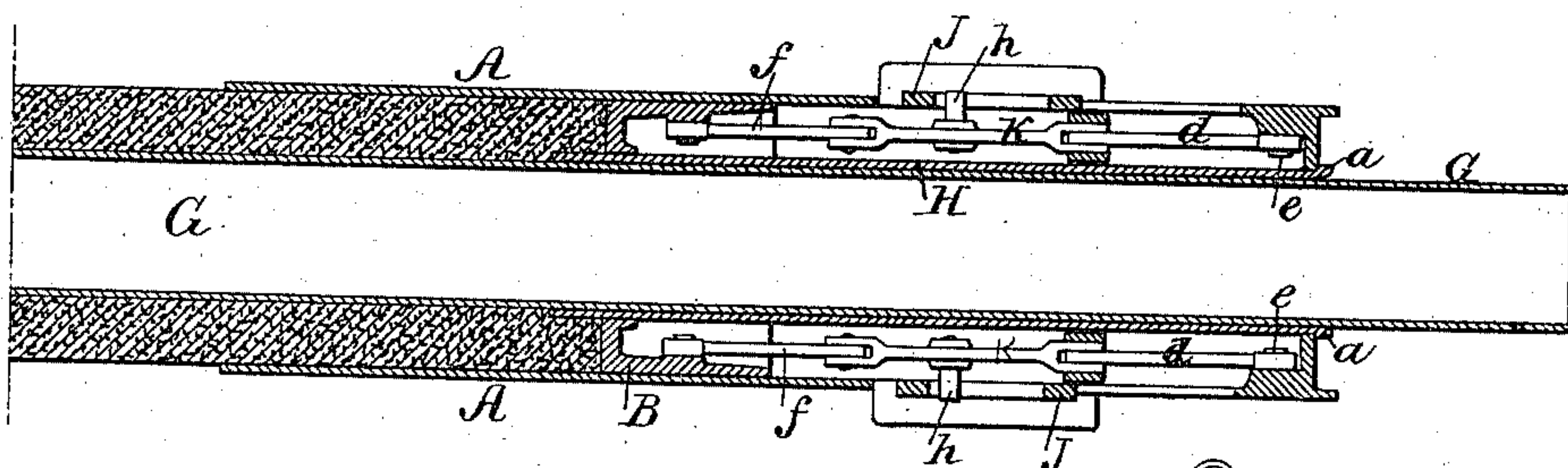


FIG. 1.

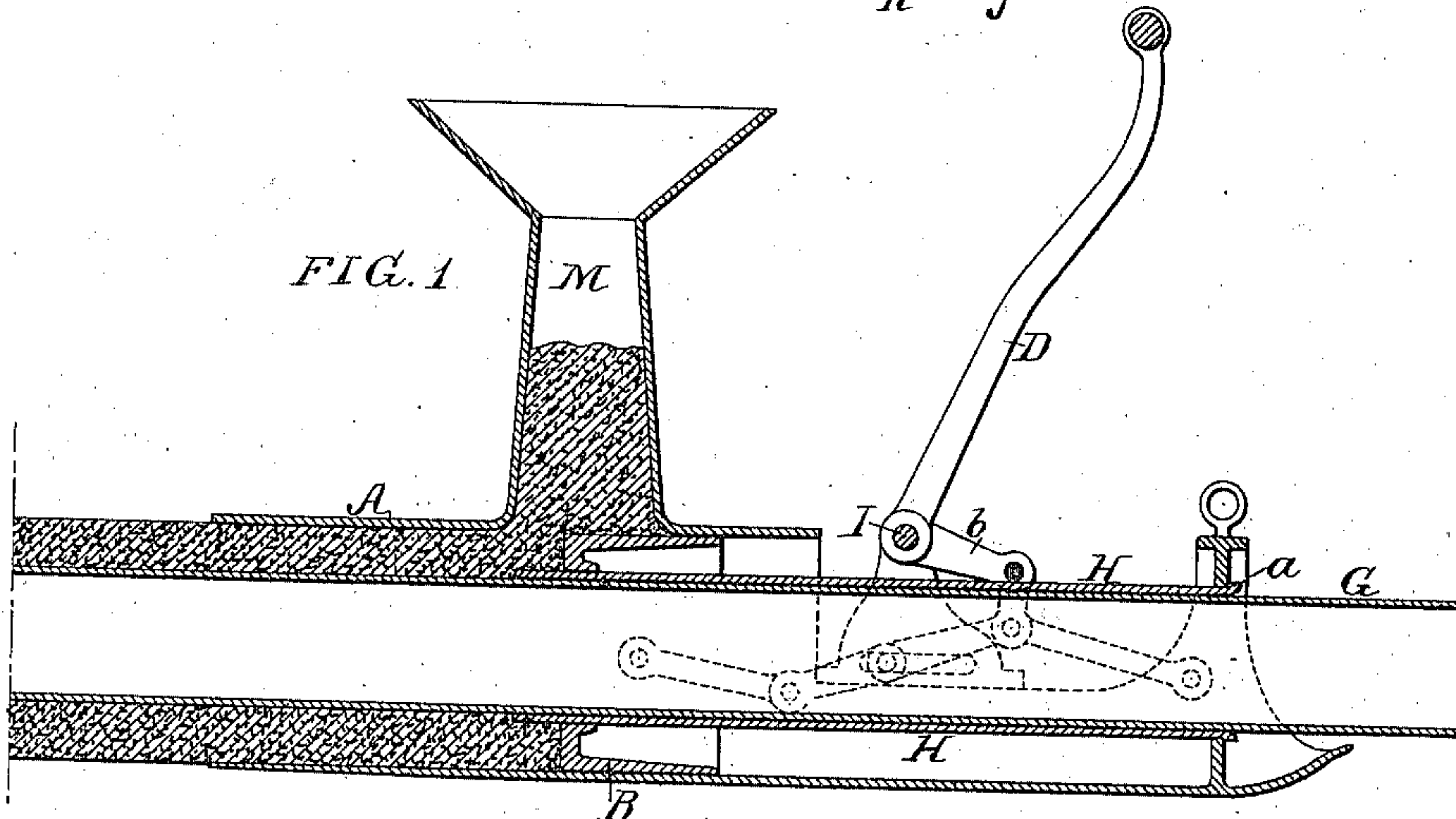


FIG. 3.

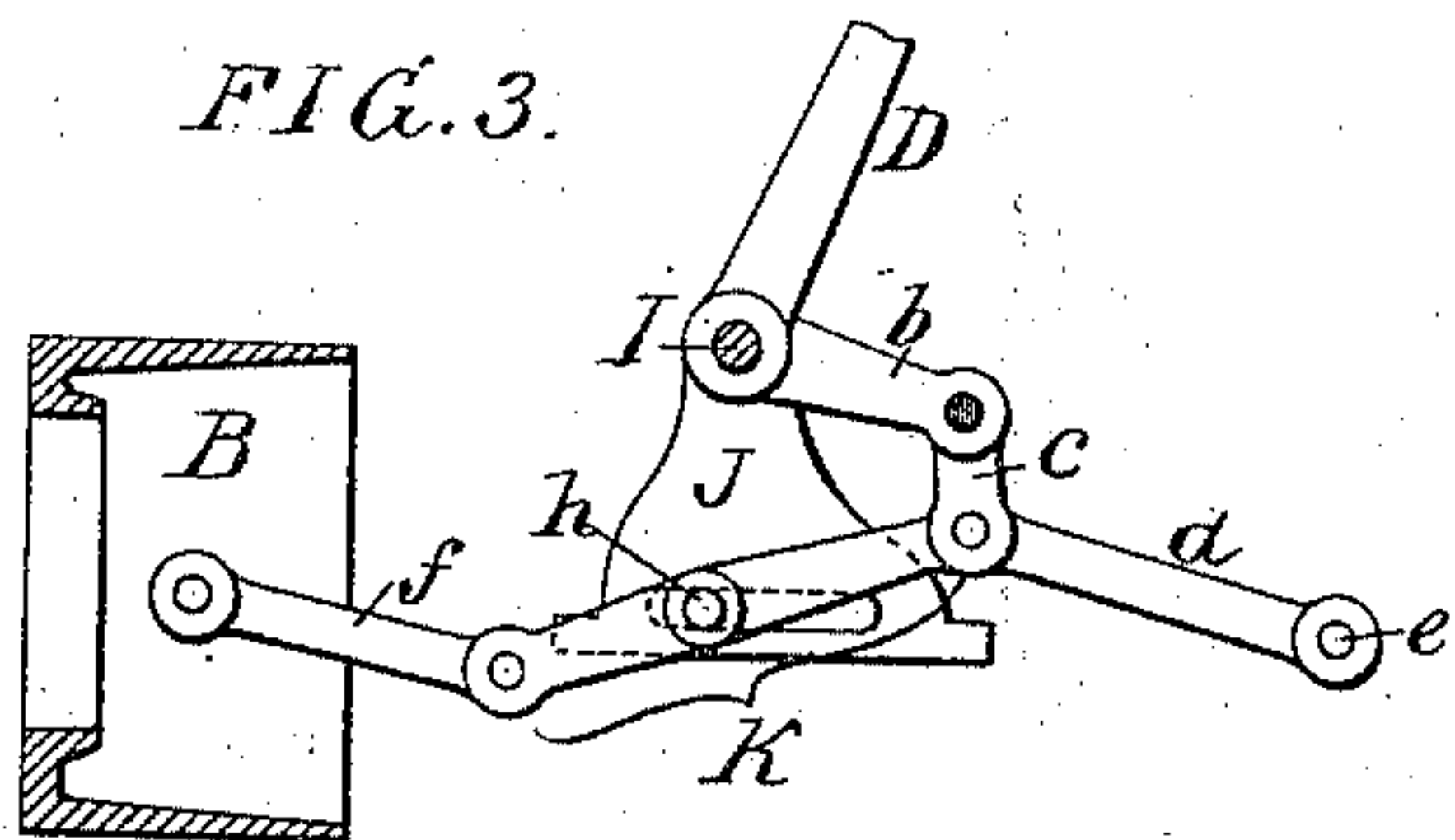
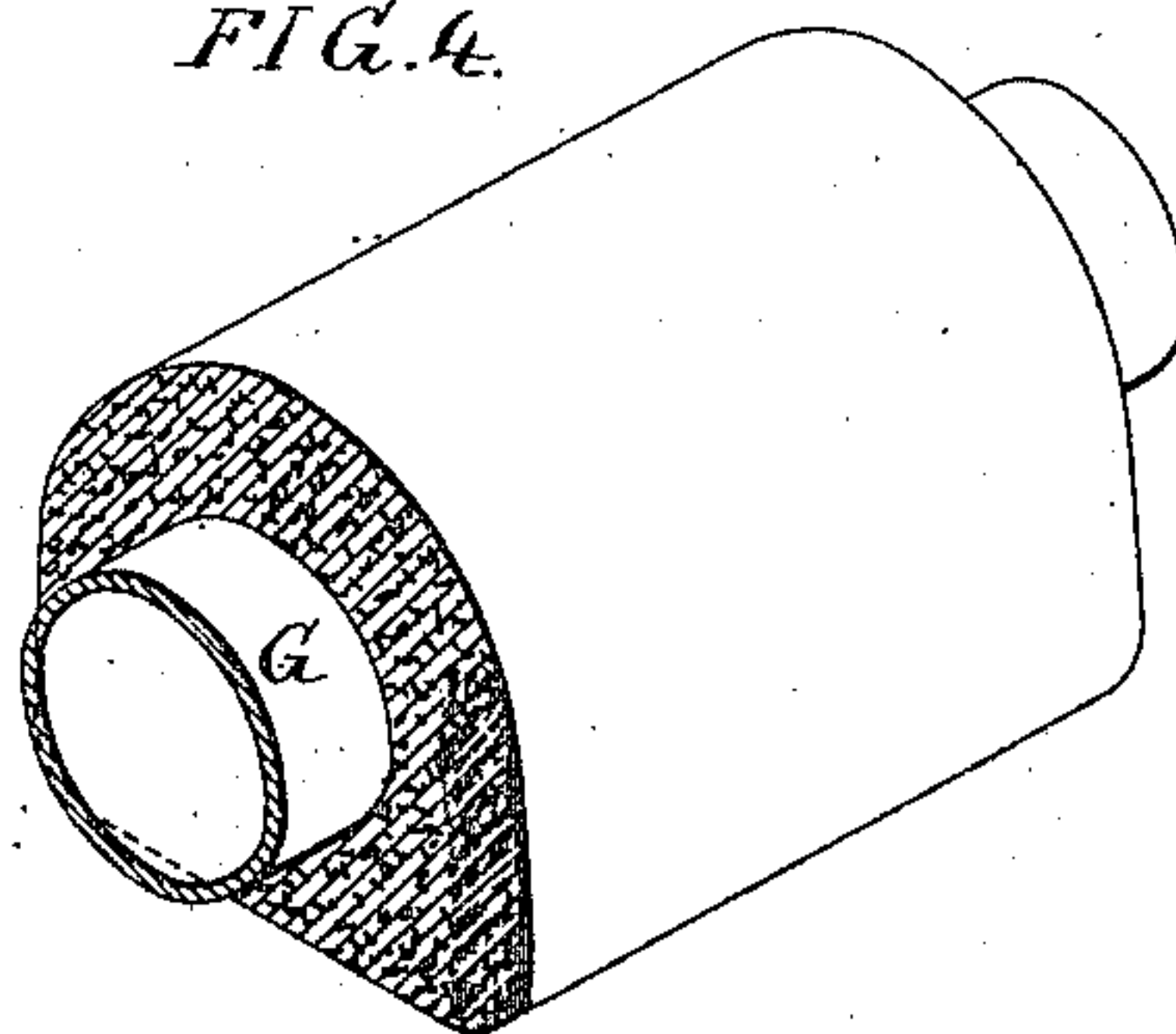


FIG. 4.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

CALVIN DETRICK, OF NEW YORK, N. Y.

MACHINE FOR MAKING LINED CONDUITS OF PLASTIC OR SEMI-PLASTIC MATERIAL.

SPECIFICATION forming part of Letters Patent No. 268,034, dated November 6, 1883.

Application filed October 1, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, CALVIN DETRICK, a citizen of the United States, and a resident of New York city, New York, have invented a  
5 Machine for Making Lined Conduits of Plastic or Semi-Plastic Material, of which the following is a specification.

My invention consists of mechanism, fully described hereinafter, for facilitating the formation of conduits composed of cement, and lining tubes round which the said cement is packed, my present invention being an improvement in the mechanism described in  
10 former patents hereinafter referred to.

In the accompanying drawings, Figure 1 is a sectional view of the machine for making the tube-lined cement conduit; Fig. 2, a sectional plan of Fig. 1; Fig. 3, a detached view of the mechanism wherewith to operate the ram or  
20 plunger of the machine, and Fig. 4 a perspective view of the finished conduit.

The machine is in many respects similar to that described in Letters Patent No. 220,757, July 8, 1879, and also in Patents Nos. 260,533,  
25 272,410, and 272,411; but the machine described in these patents was constructed for the formation of conduits by packing cement round a former or formers, which were retracted, leaving an opening or openings in the cement, whereas the present machine is for the  
30 formation of conduits of which a tubular lining forms a permanent part.

A casing, A, which is in the present instance of the form shown in Fig. 4, contains an annular plunger or ram, B, which can be reciprocated in the casing by the operating-lever D  
35 through the medium of the mechanism shown in Figs. 2 and 3, and referred to hereinafter.

G is the tube, which is to constitute the lining of the conduit, and which may be made of thin sheet-iron, or even of stiff paper; but the sheet-metal tubes made of thin spiral strips secured at the edges are preferred. The tube  
40 G passes through a guiding-tube H, the end a of which passes through and is secured in any suitable manner to the rear end of the casing, as shown in Fig. 1.

Any of the devices shown in the above-mentioned patents, through the medium of  
50 which the plunger is reciprocated by vibrat-

ing the operating-lever, may be used, but I prefer the mechanism which I will proceed to describe.

A rock-shaft, I, to which the operating-lever D is secured, has its bearings on standards J, secured to the casing A—one on each side of  
55 the same—and to this shaft are attached two arms, b, each of which is connected by a link, c, to one arm of a lever, K, and to the outer end of a link, d, which is hinged at e to the rear end of the casing, the other arm of the said lever K being connected to the ram B by a link, f. There are these links and lever on  
60 both sides of the guiding-tube G, each lever K having its fulcrum-pin h in an elongated slot in one of the standards J.

In the aforesaid patent No. 272,410 the ram was operated by a lever through the medium of a toggle-joint, so that great power might be exerted on the ram, especially at the conclusion of its forward movement; but in the present instance there is on each side of the guiding-tube a duplex toggle-joint for imparting  
70 greater power to the ram, the fulcrum-pin h sliding in the elongated slots in the standards J as the operating-lever D is vibrated.

When an underground conduit has to be laid, a trench of suitable depth is dug in the ground, and the above-described machine is placed at the bottom of this trench, after which  
80 a section of lining-tube G is passed through the guiding-tube H. The material in which the lining-pipe is enveloped may consist of ordinary cement, which is originally in a semi-plastic condition, but which subsequently becomes hard, different materials and compositions being available for the purpose. Hence in using the word "cement" I wish it to be understood that it includes any available material which, after being packed while in a  
85 plastic or semi-plastic state, will eventually become hard. The material selected is placed in a hopper, M, which communicates with the interior of the casing A, an attendant being at hand to feed this hopper, while another attendant vibrates the operating-lever and thereby reciprocates the ram, which slides in the casing and on the guiding-tube H. The consequence of this reciprocation of the ram will  
95 be the packing of cement round the lining-



pipe G. As the operation is continued, the entire machine will slowly and intermittently recede, owing to the resistance which the packed cement presents to the ram, and the receding machine will leave behind it a conduit consisting of the packed cement containing the lining-tube, which forms a permanent part of the conduit, the external shape and thickness of the packed cement being determined by the shape of the casing A, which need not be of the precise form shown in the drawings. From time to time as the machine recedes a section of lining-tube is fitted to the end of that which is being clothed with cement, so that a continuous conduit of any desired length may be made. I prefer in all cases to coat the sections of lining-tubing, no matter of what material they may be composed, with pitch or suitable pigment.

If the lining-tubing be of metal, it may be very thin and cheap, as it is re-enforced in the most substantial manner by the packed cement, and protected thereby from all liability to be injured externally.

The conduit may be made for drainage purposes, or for water or gas distribution, for containing electric conductors, and for other purposes.

I claim as my invention—

1. The combination of the casing A, its hopper, the ram B, and mechanism for operating the same with the guiding-tube H, substantially as set forth.

2. The combination of the casing A, the ram B, and operating-lever D with the duplex toggle-joint devices, through the medium of which the ram is reciprocated by the said operating-lever, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CALVIN DETRICK.

Witnesses:

JOHN E. PARKER,  
HARRY SMITH.